

# Sea Level Rise and Coastal Hazards in Washington State

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The Future Ain't What it Used to Be: Planning for Climate Disruption

2005 Regional Climate Change Conference

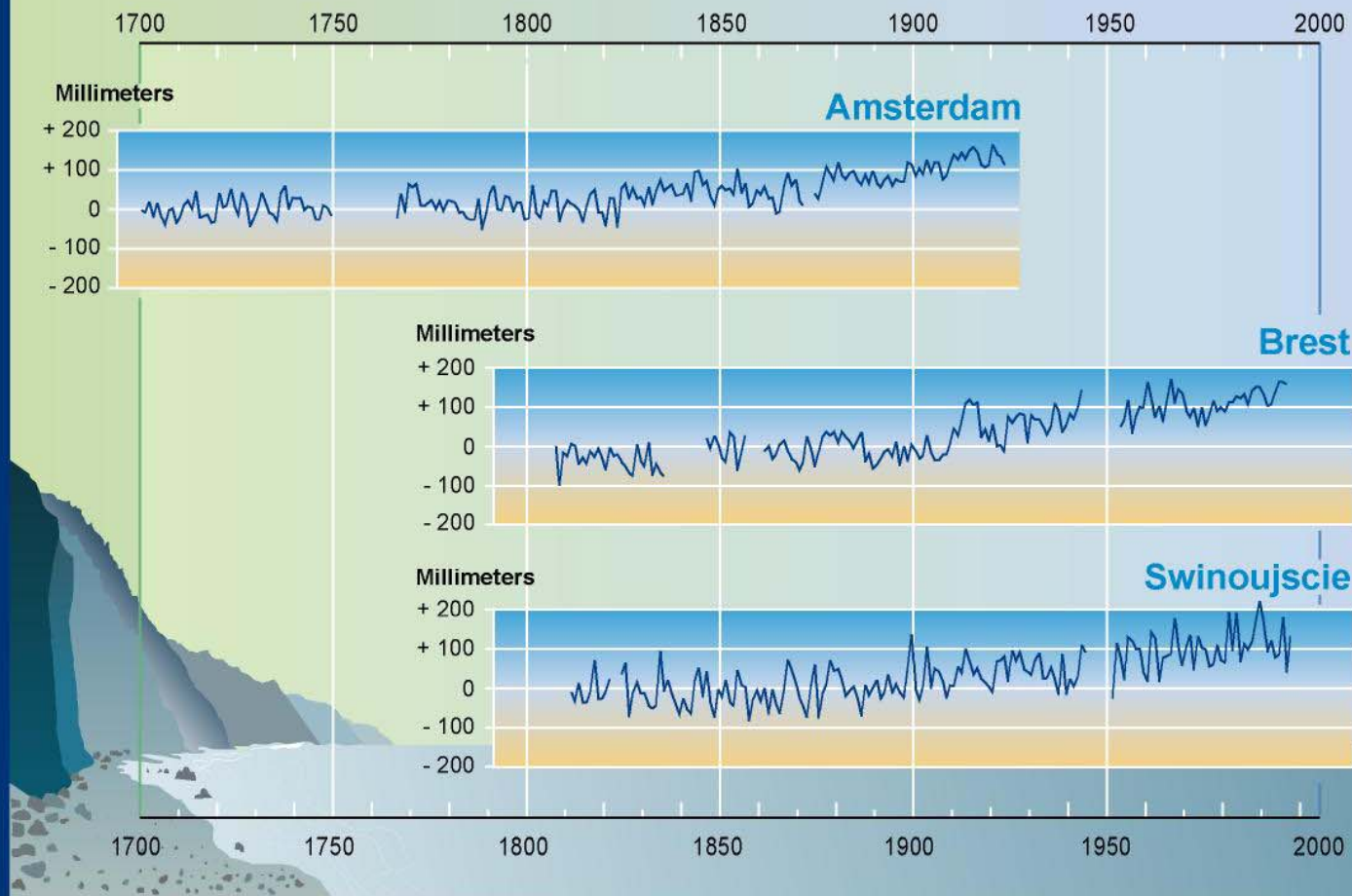
Seattle – 27 Oct 2005

# Climate & Cascadia Coastal Zone

- Sea Level Rise
  - Coastal erosion
  - Inundation
  - Other...
- Combined with increased winter precipitation
  - Bluff landsliding
  - Flooding

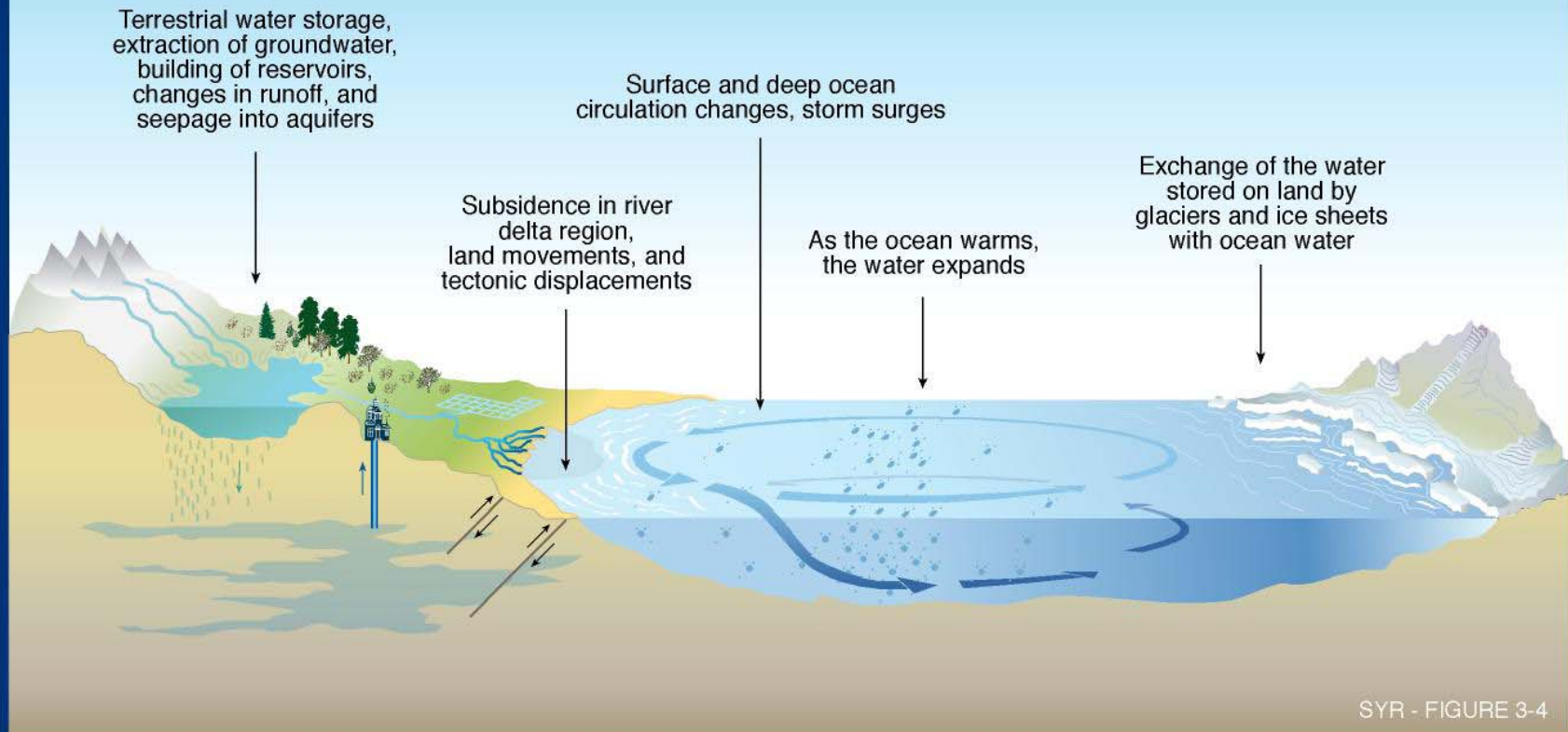


## Relative sea level over the last 300 years



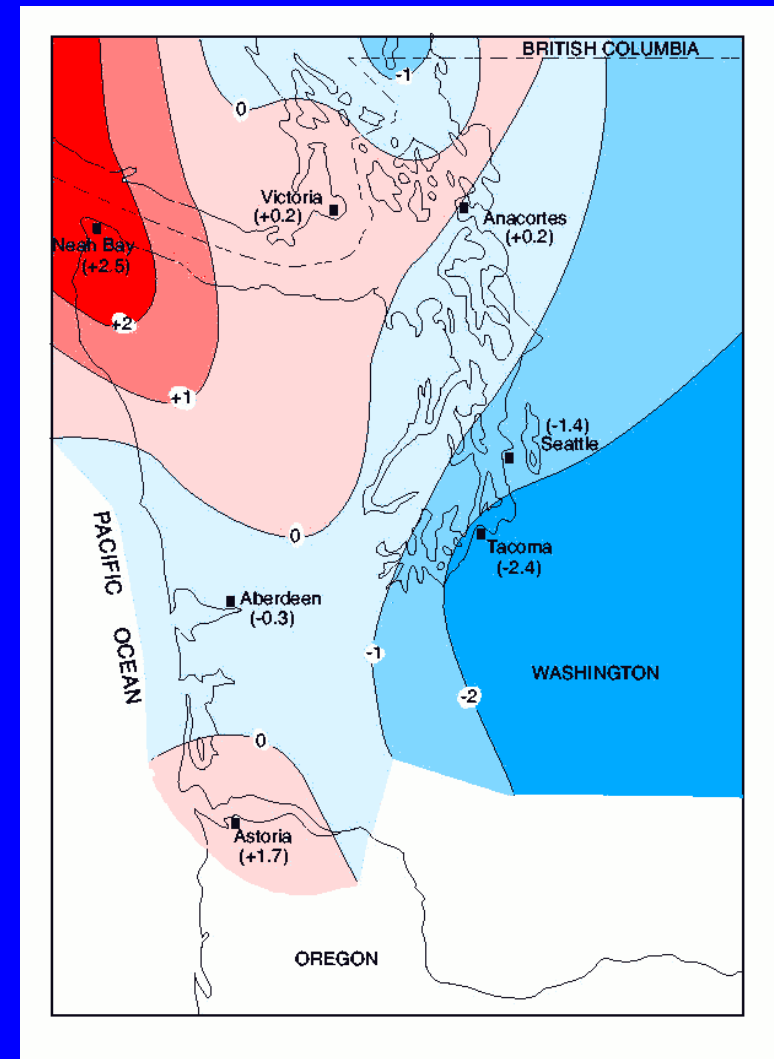
SYR - FIGURE 2-5

## What causes the sea level to change?



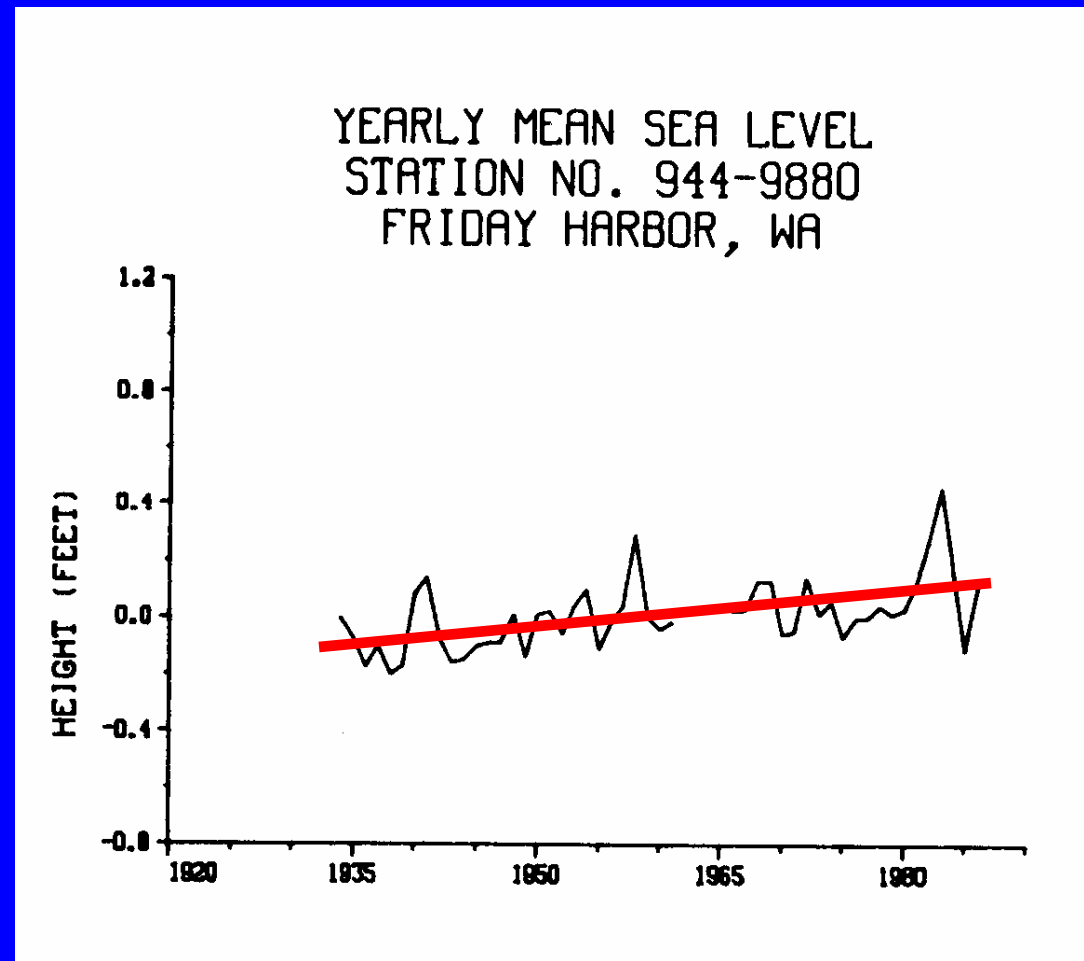
# Vertical Land Movement...

- ... alters sea level rise rates
  - Subduction zone tectonic forces 'wrinkle' the land surface:
  - Uplift occurs on most of the Ocean coast
  - Subsidence occurs in most of Puget Sound



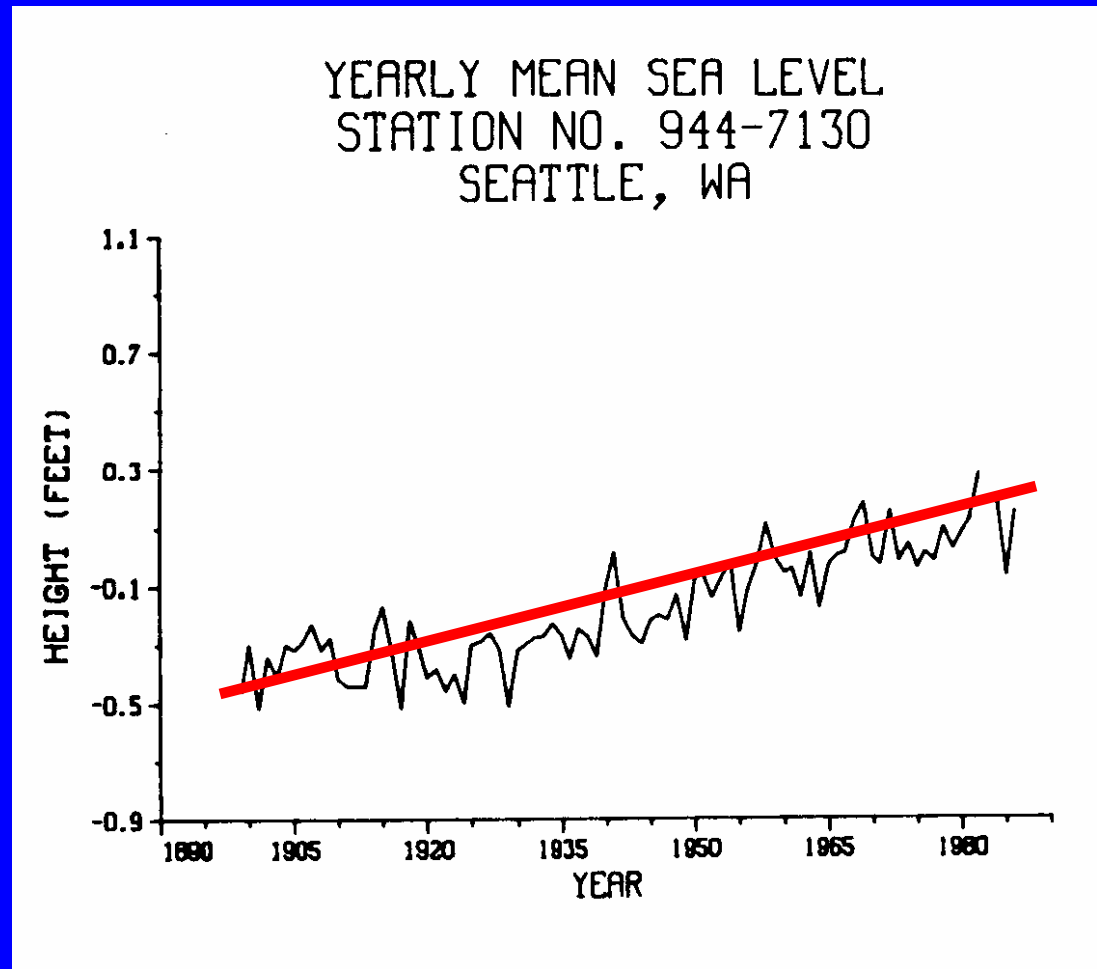
# Friday Harbor sea level trend

From 1935 to the present, water level at the Friday Harbor gage has been rising at about the global average.



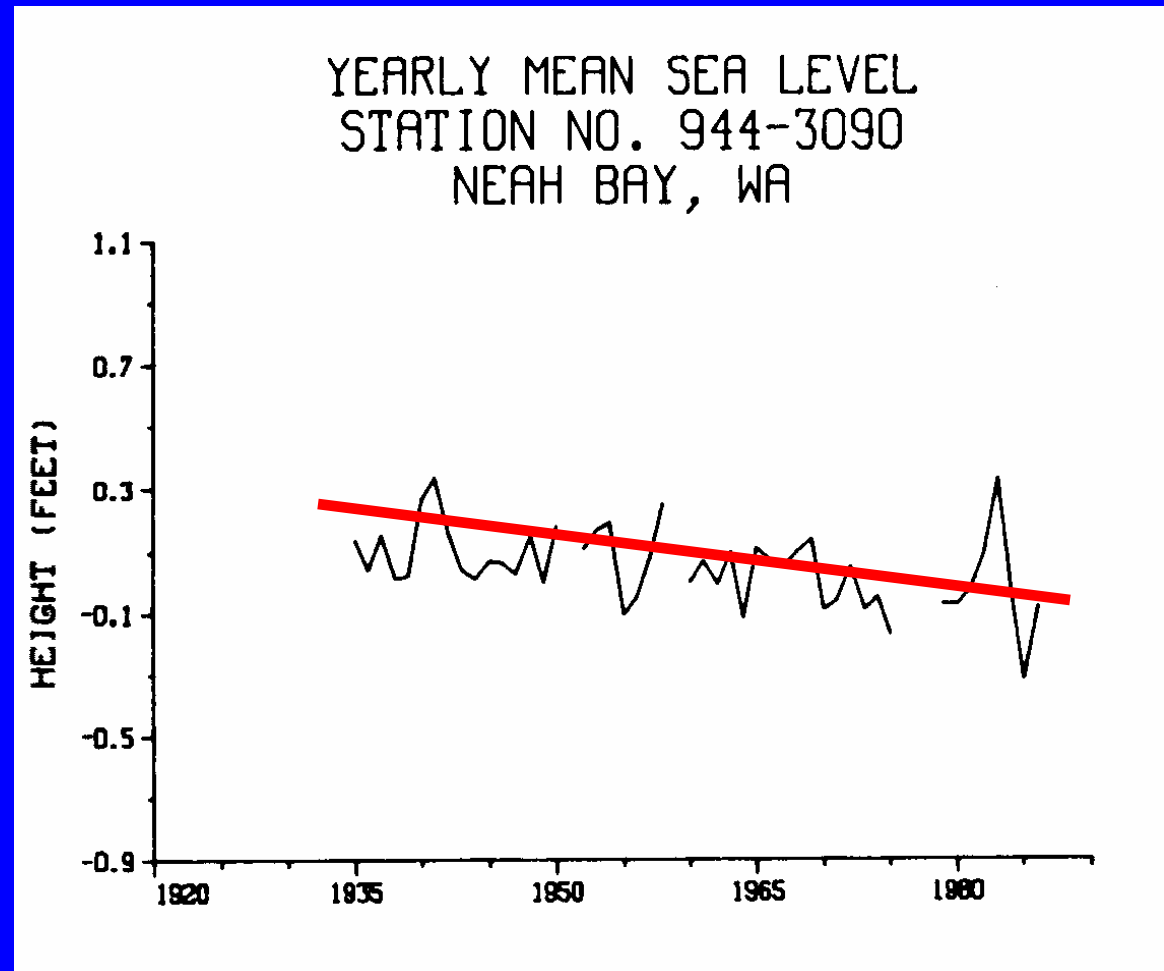
# Seattle sea level trend

From 1900 to the present, water level at the Seattle gage has been rising at about 2X the global average.



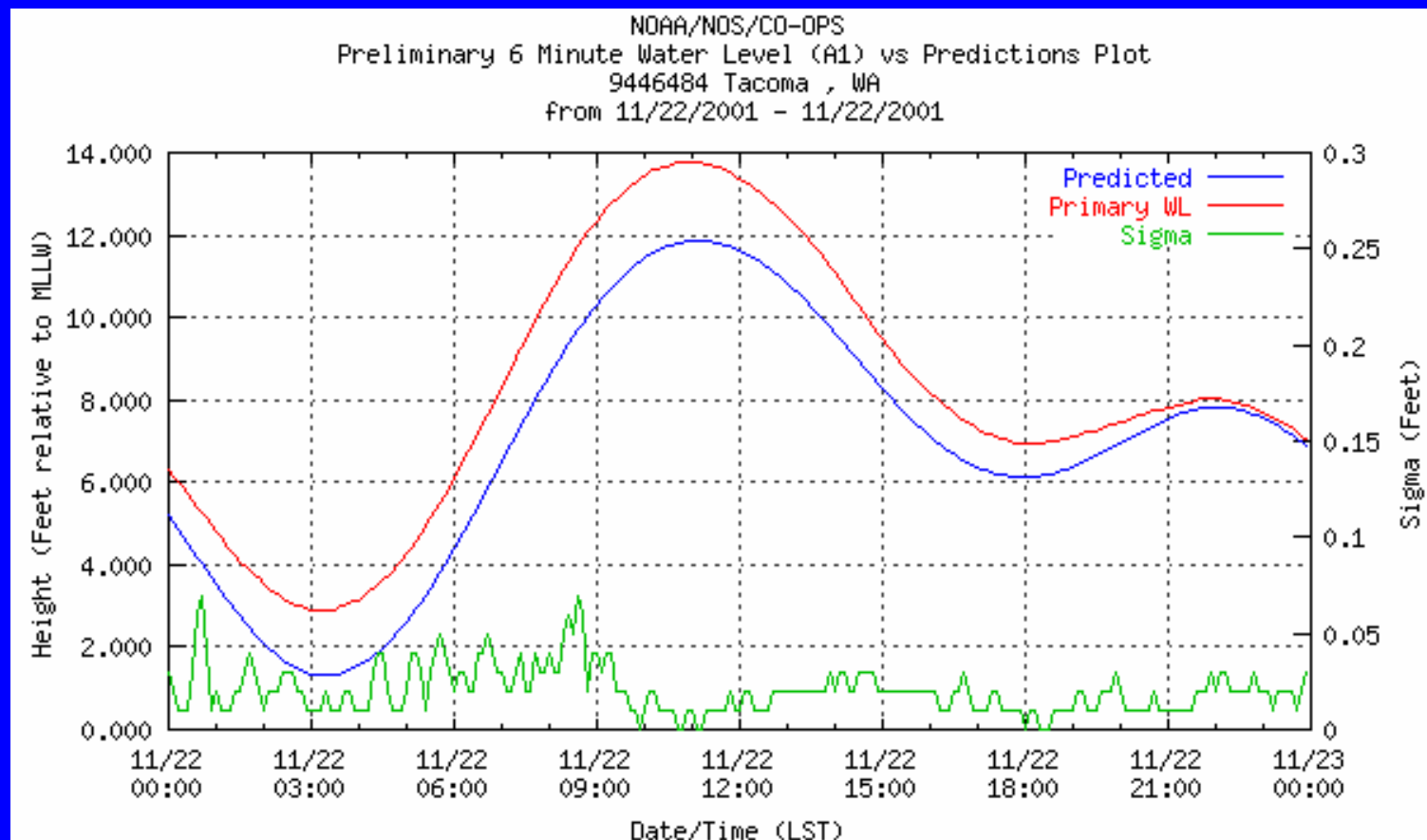
# Neah Bay sea level trend

From 1935 to the present, water level at the Neah Bay gage has been trending down.





# Barometric Pressure Effects



Short term low pressure cells allow water level to rise: up to 2.0 ft on 22 Nov 2001 at Tacoma

# El Niño

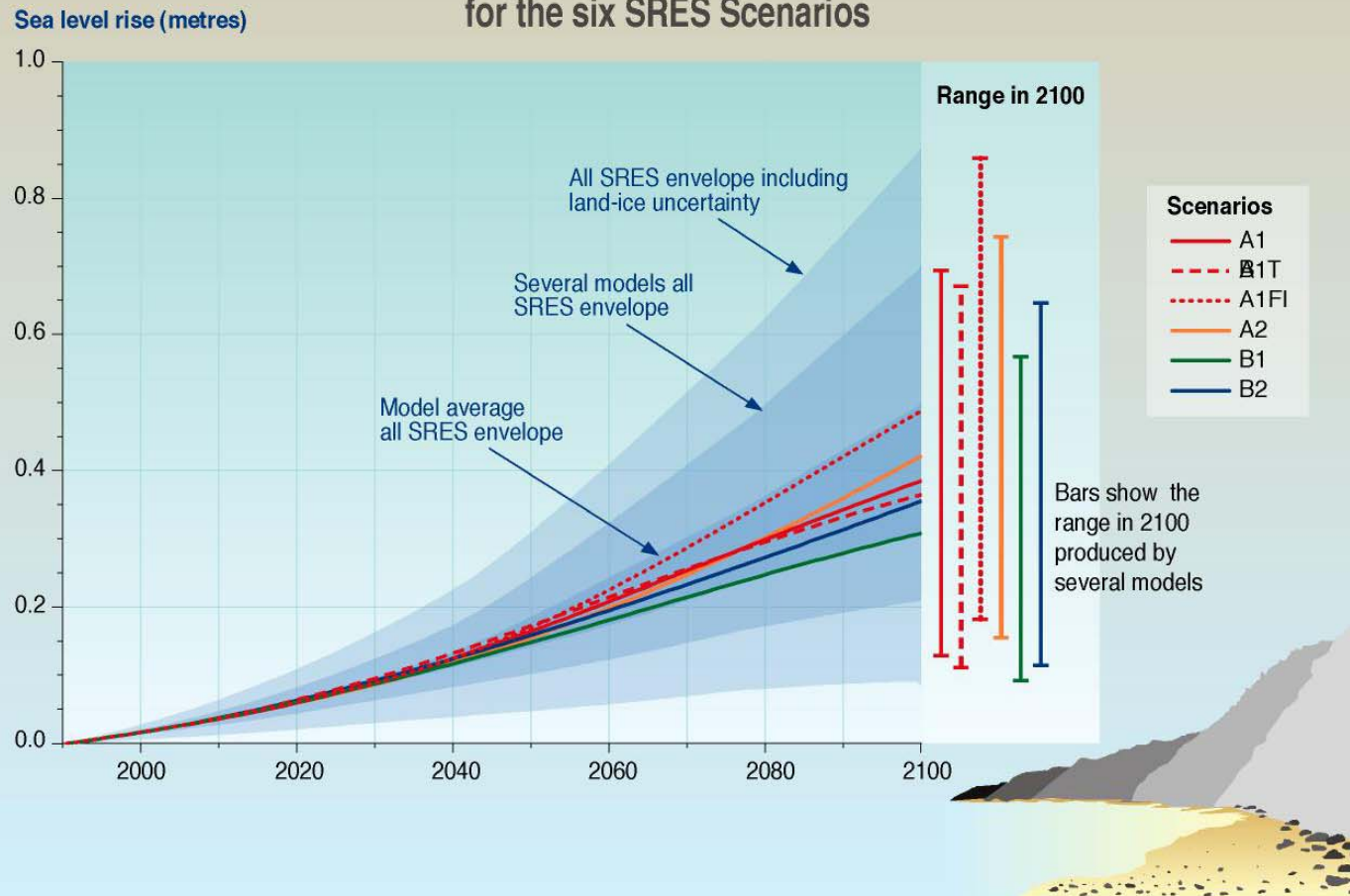
November 1997

# La Niña

February 1999

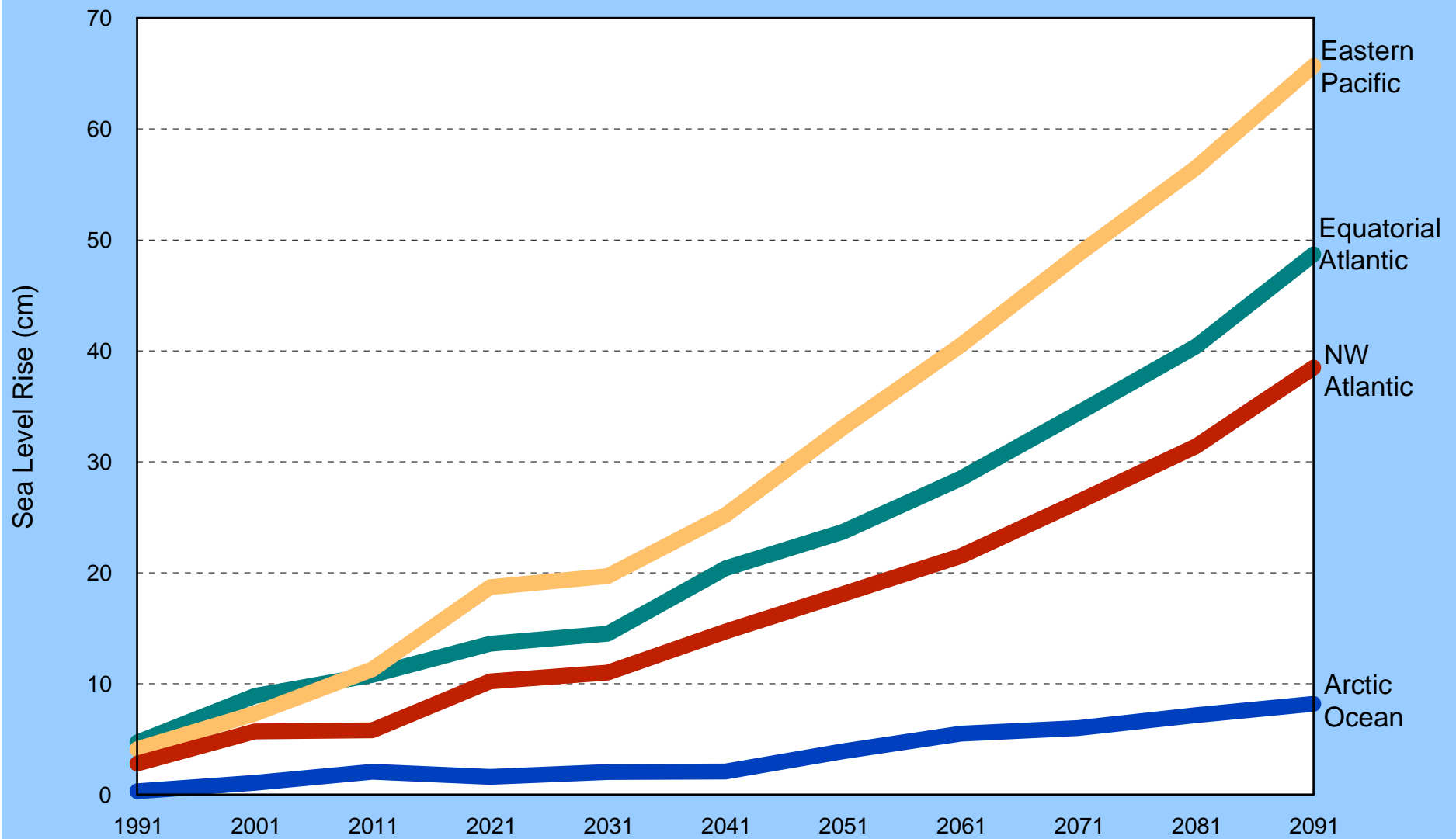


## Global average sea level rise (1990 - 2100) for the six SRES Scenarios



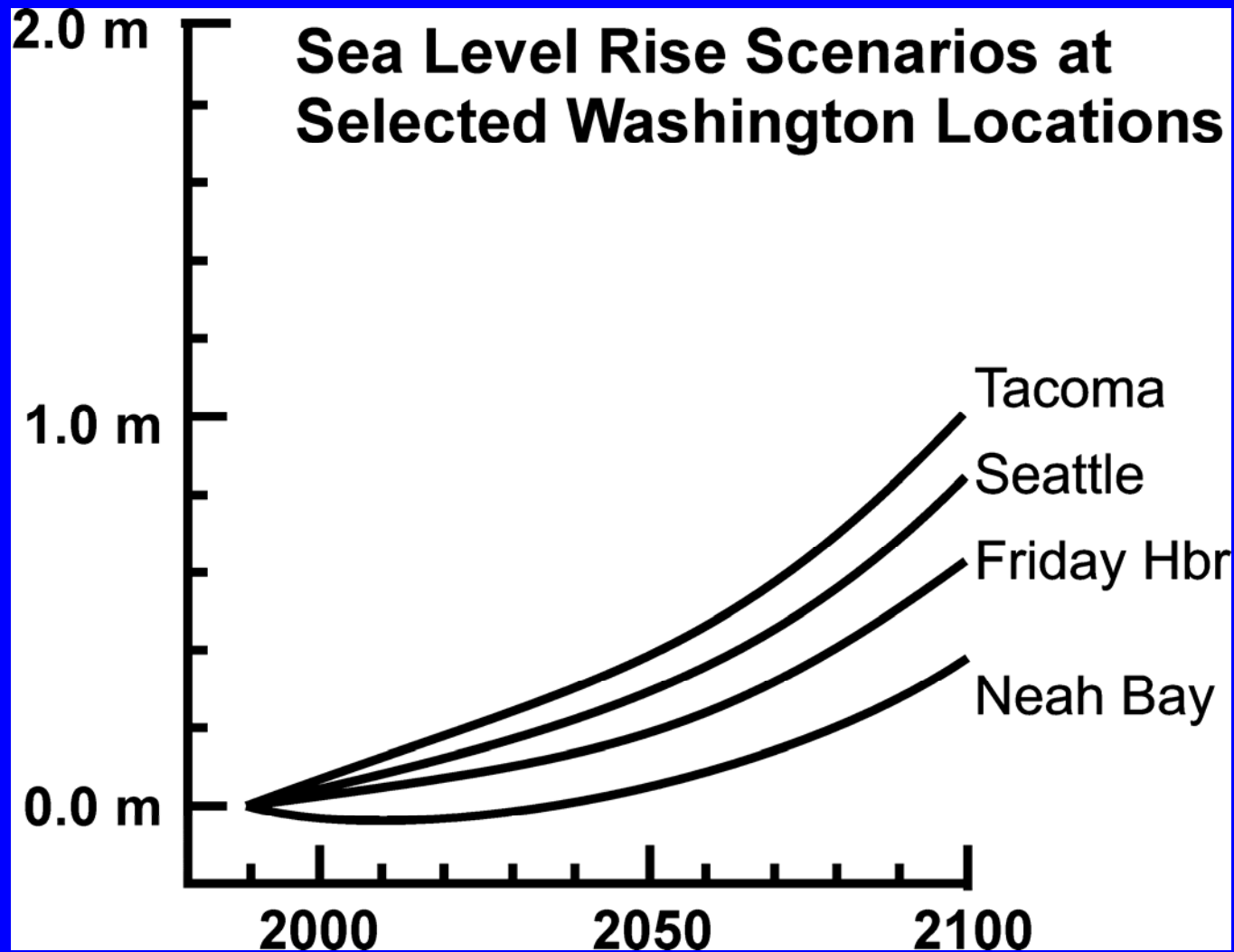
WG1 TS FIGURE 24

# Regional Changes in Sea Level



Source: Canadian Climate Change Model

# Combining it all for Washington...



# Sea Level Rise & Inundation



Port of Olympia Peninsula

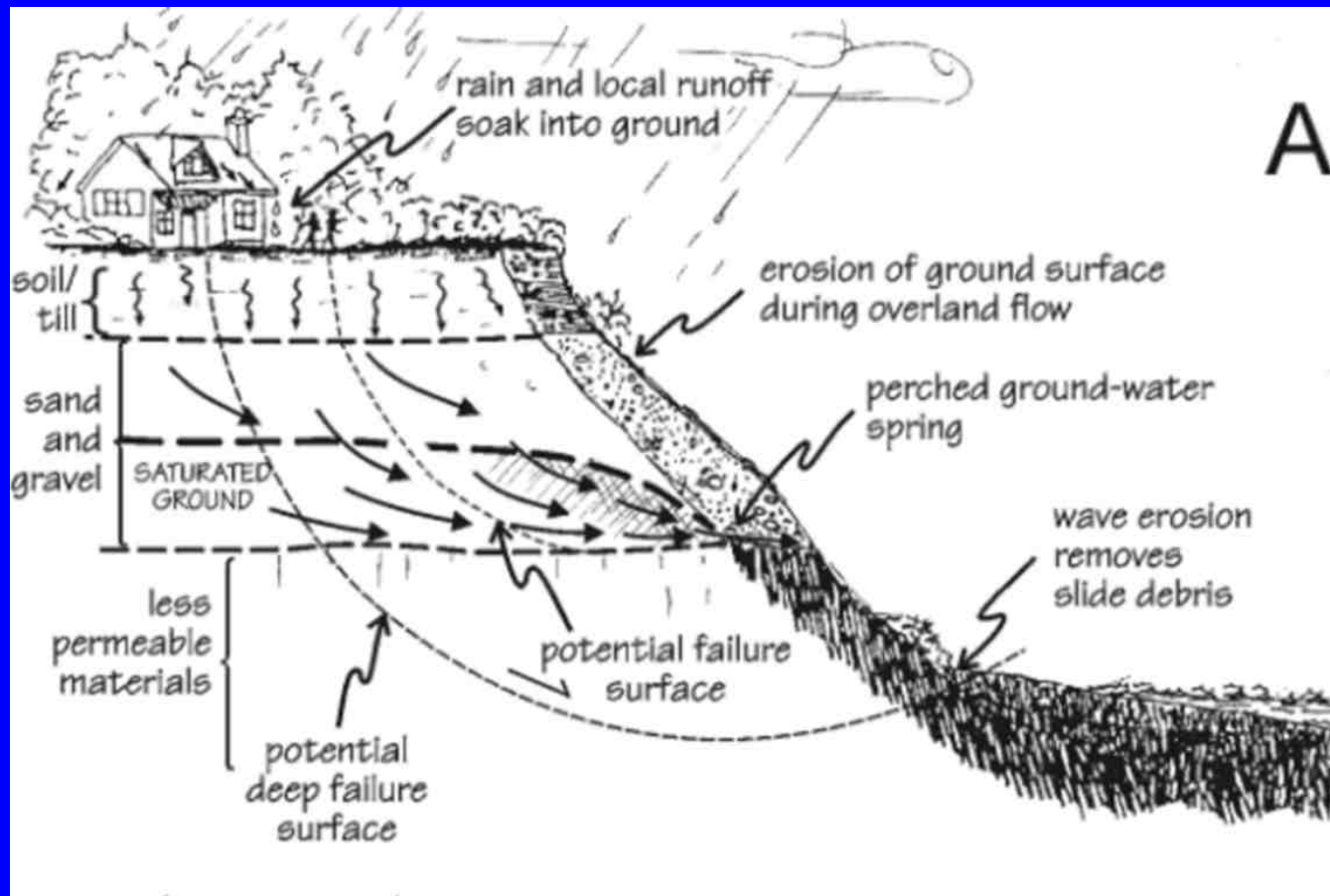


# Coastal Erosion



Point Brown, Ocean Shores — 1997 - 98

# Puget Sound Bluff Landsliding





# Management & Response

- Shoreline Management Act
  - Local Shoreline Master Programs
- Growth Management Act
  - Local Geologic Hazards Critical Area
- Floodplain Management Act
  - Local Comprehensive FCM Plans
- Puget Sound Plan
- Aquatic Lands Management Act

# SLR Response as Risk Response

- We respond to flood hazards by linking *what's* at risk with the *probability* of flood risk, e.g. higher risk situations are managed by applying progressively lower probability, higher severity events (e.g. 100 year, 500 year event).
- We could respond to SLR hazards by associating what's at risk with the severity of the SLR scenario, e.g. higher risk situations are managed by applying progressively more aggressive SLR scenarios.

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